

Do Now: VANG $y = \frac{1}{2}x^2$

V

AOS: $x=0$

Vertex: $(0, 0)$ max

y-int: 0

A

$$y = \frac{1}{2}x^2$$

$$y = -\frac{1}{2}(0)^2$$

$$y = -0^2$$

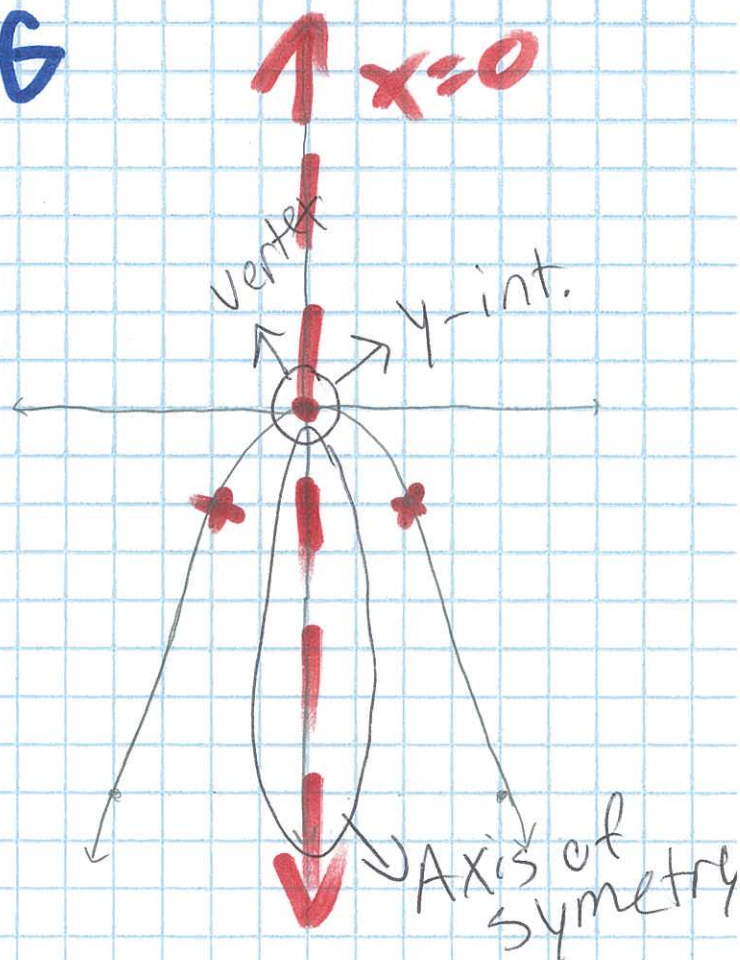
$$y\text{-int} = 0$$

N

x	y
-4	-8
-2	-2
Vertex 0	0
2	-2
4	-8

→ y-int.
minimum
maximum

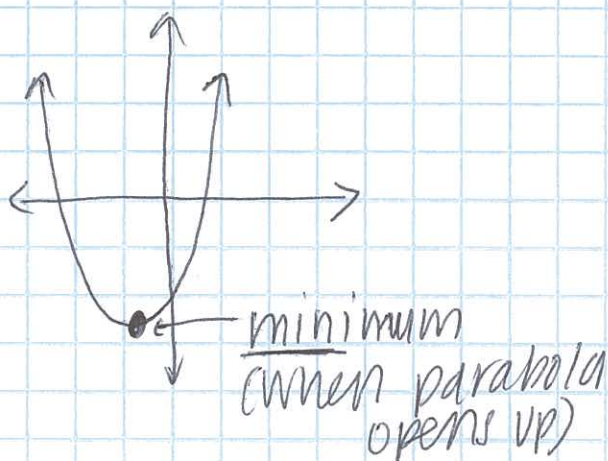
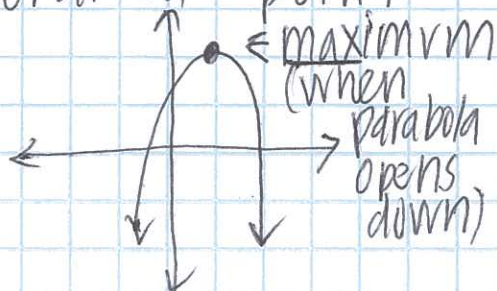
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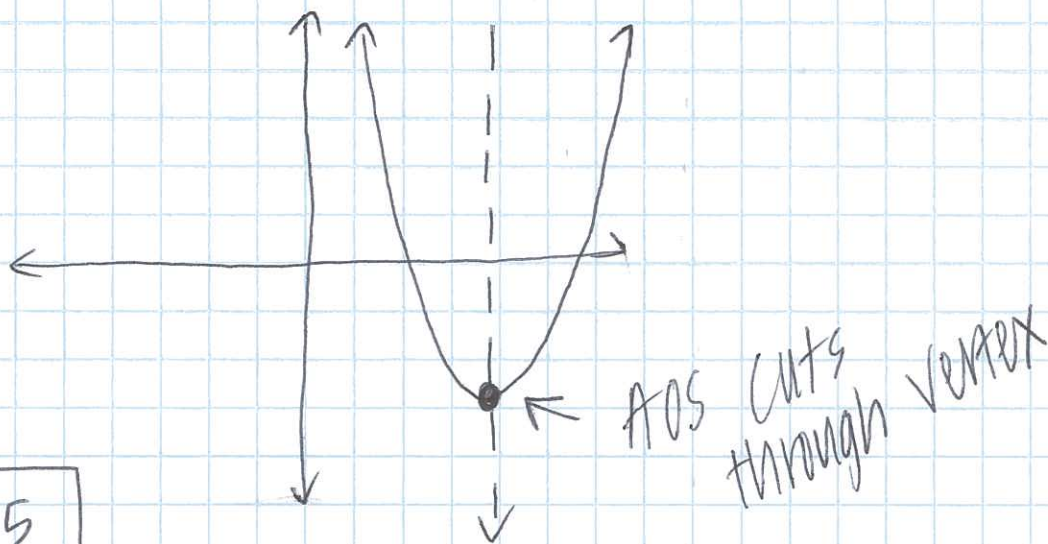
CW #1: Graph Quadratic Equations

Definitions:

Vertex: The highest or lowest point on a parabola. This can be a maximum or a minimum. Vertex is written as a coordinate point.



Axis of Symmetry: The line that passes through the vertex and divides the parabola into two symmetric parts. AOS is written as an equation $x = \#$



Graphing $y = ax^2 + bx + c$

When graphing $y = ax^2 + c$, the vertex remains on the y-axis and the AOS was always $x = 0$.

Now, the graph of $y = ax^2 + bx + c$ will be anywhere in the coordinate plane. We will need to calculate the AOS.

To Find AOS:

- 1) use formula $x = -\frac{b}{2a}$
- 2) this will also be the x-coordinate of the vertex (because AOS goes through vertex)
- 3) To find vertex, substitute the value for x into the original equation. This will give us the y-coordinate of vertex.

$$\checkmark \quad y = \underset{a}{2}x^2 - \underset{b}{6}x + \underset{c}{2}$$

AOS: $x = 1.5$

vertex: $(1.5, -2.5)$, min

y-int: 2

x-int: (we will learn this soon)

Q

A

AOS:

$$-\frac{b}{2a} = \frac{6}{2(2)} = \frac{6}{4}$$

$$x = 1.5$$

vertex: $2(1.5)^2 - 6(1.5) + 2$

$y = -2.5$
 $(1.5, -2.5)$

y-int
 (0 in for

$x): y = 2(0)^2 - 6(0) + 2$
 $y = 2$

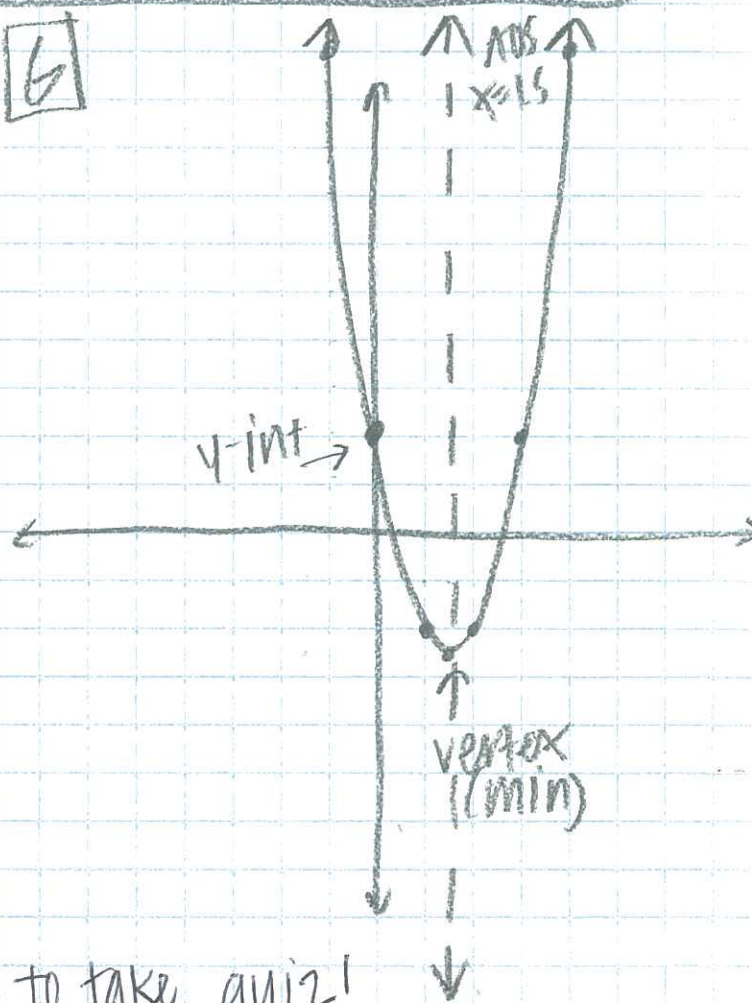
N

x	y
-1	10
0	2
1	-2
1.5	-2.5
2	-2
3	2
4	10

y-int

vertex

G



Finish CW - turn in exit slip to take quiz!

CRS	Algebra Content; XEI 605 Solve quadratic equations
Objectives	1.1 Graph quadratic equations in standard form (w/ or w/o calc) 1.2a define vocabulary related to quadratic graphs (vertex, axis of symmetry, minimum or maximum) 1.2b Find (w/ or w/o calc) vertex, axis of symmetry, and minimum or maximum of a parabola.

Directions: Use your graphing calculator to VANG the following equations:

1) $y = \frac{1}{3}x^2$

5) $y = -4x^2$

8) $f(x) = -\frac{1}{4}x^2 + 2x + 4$

2) $y = -\frac{1}{2}x^2$

6) $y = -x^2 - 4x + 3$

9) $f(x) = 3x^2 - 6x + 2$

3) $y = -2x^2 - 1$

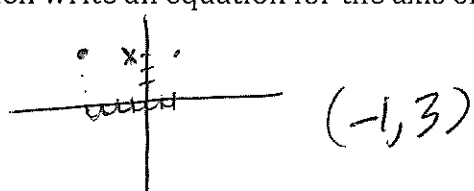
7) $y = -2x^2 - 8x - 11$

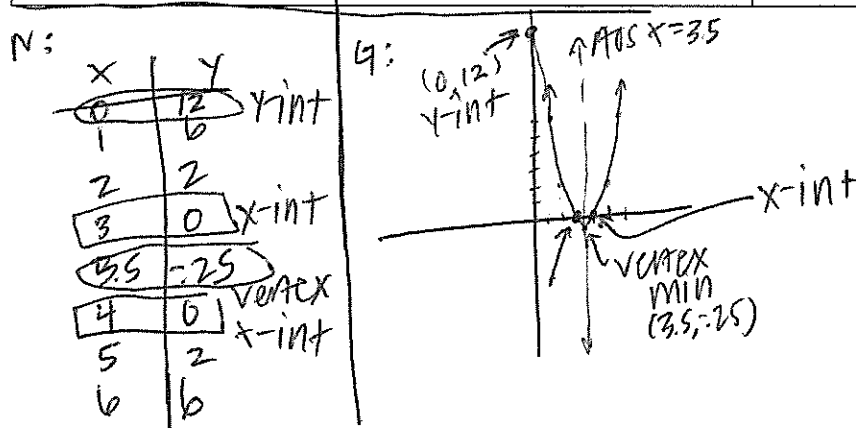
10) $y = 2x^2 + 8x + 4$

4) $y = 3x^2 - 4$

11) How is the vertex of a parabola related to its axis of symmetry?	12) Why is it useful to know the axis of symmetry when graphing a parabola?
13) Can a quadratic function have a minimum and maximum value? Explain.	14) What is the difference between a linear equation and quadratic equation?

EXIT SLIP (on a $\frac{1}{2}$ sheet of graph paper from your notebook):

1) VANG the following: $y = x^2 - 7x + 12$ V: AOS: $x = 3.5$ VERTEX: $(3.5, -2.5)$ min Yint: 12	2) The points $(2, 3)$ and $(-4, 3)$ lie on the graph of a quadratic function. Explain how these points can be used to find an equation of the axis of symmetry. Then write an equation for the axis of symmetry. 
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$x = -1$
because this
cuts parabola
in $\frac{1}{2}$